# Innovative Idea for Conservation Rate Structure

**August 17, 2012**

**Slide 1**

Thank you all for coming today. We are Matt Williams and Frank Loge, and we are here today to discuss a novel equitable approach to financial sustainability in water rate structures.

**Slide 2**

Together we got into the specifics and challenges of this issue in our roles as members of the Water Advisory Committee for the City of Davis

**Slide 3**

The problem that Davis and all California cities and water agencies face starts with the fact that the overall efficiency of urban water use has been increasing. The numbers you see here are from the Public Policy Institute of California, and the 201 gpcd is slightly higher than the 192 gpcd proposed as the Baseline in the 20x2020 program.

However, conservation creates a fiscal problem for agencies because declining revenues do not cover the agency's fixed costs.

One solution to that problem would be to raise the fixed component of the rate structure, but that would violate the best management practices in the urban water conservation plan that set a maximum target that no more than 30% of tan agency's total revenue come from fixed rates.

**Slide 4**

So water agencies raise rates more frequently . . . and greatly anger customers.

**Slide 5**

Which creates a very painful political and fiscal dynamic that is a lot like a saw, with political pain for the agencies when they propose rate increases and fiscal pain during the periods of declining revenues.

**Slide 6**

Please raise your hand if you are here today because you believe that this is a problem that needs a solution.

And we have just such a solution. Specifically we propose an extension of water budgets in that allocate the fixed costs into the rate structure on a budget.

It is very important to note that the focus of this presentation is on how to address the structural deficit problems that virtually all water rate structures have in the fixed rate portion of their overall rate structure.

We do not in any way advocate any abandonment of the variable rate innovations like water-budgets and inclining blocks, etc. that have worked so well in incentivizing responsible water use and increased water conservation over the past 20 years.

This is not an either/or situation, but rather a both/and situation. There is a clear need for both, a structural fix for accurate revenue recovery and a conservation recognition within the water rate design.

It is also our belief that there is a significant Prop 218 proportionality issue in meter-size based fixed rates.

**Slide 7**

Lets look at the standard approach . . . allocating fixed cost base on meter size.

**Slide 8**

The next three slides are from the material presented to the Water Advisory Committee by the rate study consultant, Bartle Wells.

Here you see Davis' current fixed rate charge structure.

**Slide 9**

Bartle Wells analyzed the current year budget for the water agency and segregated the expenses into fixed and variable components, with the M&O proportions being 67% fixed and 33% variable.

**Slide 10**

Their analysis of revenues produced the exact reverse of the costs, with 67% of the revenues variable and 33% of the revenue fixed.

So Davis' rate structure is in compliance with the BMP in the California Urban Water Conservation Plan.

**Slide 11**

When you compare those fixed and variable, cost and revenue proportions, you can see that for every $2 of revenue lost to conservation only $1 of cost is saved.

**Slide 12**

With the end result being a Structural Deficit.

The bottom-line of that deficit is that the more our customers conserve the greater the deficit becomes.

**Slide 13**

There are three ways to deal with a structural deficit in a water agency.

The first of which is to establish your rates at a high enough level so that they initially create a revenue surplus. That surplus will erode over time as the community conserves more and more water. I don't think it will take much imagination to predict that many people will simply see that as "gouging."

The second is to run the water agency at a deficit, drawing down reserves, if the agency has reserves.

We all know that that is no longer possible in today's economy and political climate.

The third is to go back to the consumers frequently with a new Prop 218 notice for a rate structure with higher rates.

In practice, agencies use all three in combination.

**Slide 14**

Bottom-line, none of these three options meets the standard of providing reasonable and stable water rates for the customer . . . and all three options are political dynamite.

**Slide 15**

Underlying Consumption-based Fixed Rates are a pair of premises:

The first premise is that bigger homes take more of the water system capacity than smaller homes, which is a straightforward reality that is confirmed by the fact that in general the consumption charges on the bi-monthly water bills for bigger homes are larger than those for smaller homes.

The second premise is that bigger homes get more value from the water system capacity than smaller homes.

**Slide 16**

However, meter size does not reflect either of those premises. In Davis almost 90% of the single-family residences have a three-quarter inch meter, but the diversity of homes getting their water through that three-quarter inch meter is incredibly wide.

DISTRIBUTE TABLE FROM MANUSCRIPT

While meter-size-based fixed rates seem proportional and fair at first sight, they are a simplistic, indirect, and inexact measure of proportionality. A single 5/8" meter represents a small fractional percent of a district's total water capacity, and a fixed rate based on that portion has intuitive appeal: a single line represents a tiny fraction of the total system, and should pay based on its "share" of the system. However, both the numerator and the denominator of this fraction represent maximum possible flows. Only the denominator represents something real: the maximum peak demand to which the water utility must scale the system. The numerator, on the other hand, is fanciful: a substantial proportion of all consumers cannot use the full peak capacity their meter size affords them. Meter-size- based rate schemes are therefore based on the potential demand, rather than the actual demand a consumer places on the system. Thus, tiering by meter size, while simple and expedient, does not meaningfully reflect the actual demand a customer places on the water system's fixed infrastructure.

**Slide 17**

Further, when system sizing decisions are made by an agency, the agency typically studies and models actual composite system usage rather than potential system use.

**Slide 18:**

What we propose is a solution to all the above problems . . . specifically, Consumption-based Fixed Rates.

**Slide 19:**

Here's a step-by-step model we have developed that explains how to construct Consumption-based Fixed Rates

**Slide 20:**

The first step in the process is to as closely as possible reflect the decisions that were made in creating the system. The data table you see here shows actual water consumption data for the City of Davis.

We have highlighted two different bi-monthly periods . . . the first being the summer peak usage period in July-August, and the second being the total usage for the year.

**Slide 21:**

Tables are nice, but pictures are better. Here is the graphic of that same data that Doug Dove showed us in his first presentation, which makes it very clear that the Davis water system has been created in order to handle the peak demand of irrigation in single-family homes in the summer. Anyone disagree?

**Slide 22:**

The second step is to calculate the proportional consumption for all the individual accounts in the whole system. What the resultant table shows is that for the 14,395 single-family accounts in our system, the average account allocation is going to be approximately one third of one one-hundredth of 1% of the total consumption of the system, and the sum total of all the allocations of the 16,432 accounts is 100%.

**Slide 23:**

The third step to our process is to allocate a specific Fixed Cost to each individual account. In the far right column you see how Bartle Wells' $6.7 million of Fixed Costs is allocated by Class. Please note that 1) each individual account gets its fair proportion of those total Fixed Costs, and 2) that every single dollar of the $6.7 million gets allocated , , , and in the process we have instantly achieved both Fiscal Stability and Fiscal Sustainability without compromising either Proportionality or Water Conservation incentives. *Bottom-line, we have met our standard of providing reasonable and stable water rates for the customers.*

**Slide 24:**

With all the Fixed Costs allocated, we now turn to the fourth step and look at Variable Costs . . . $3.3 million in the Bartle Wells analysis. Why take the time to do this? The answer to that question is a bi-product of the fact that we now have 100% of our Fixed Costs covered by our Fixed Revenues. No longer do we have to use any of our Variable Revenue to cover Fixed Costs, and as a result we have a dollar for dollar match of Variable Costs and Variable Revenues. Costs and Revenues will go up and down in lock step with one another.

That gives us an opportunity to better address Prop 218 "Proportionality."

To do that we take the $3.3 million of Variable Costs and divide them by the total annual water consumption. The result is $0.74 per CCF, which is a number that applies to every account in every Class regardless of volume of water consumed . . . no matter how high or how low those variable costs may adjust due to conservation.

You can call that $0.74 the "proportionality value" for the Davis system. Why is that meaningful?

At our Water Advisory Committee meetings we heard the Chamber of Commerce strongly advocate for a Uniform Block rate structure for Variable Fees. In a rate structure that supports the Bartle Wells numbers, that uniform block rate would be $0.74 per CCF.

At the same time, for the 14,000 Single Family Residences you could implement an Inclining Block structure or a Water Budget structure, and as long as the blend of high and low rates has a weighted-average of $0.74 you have demonstrable proportionality. In fact, once again we have achieved both Fiscal Stability and Fiscal Sustainability without compromising either Proportionality or Water Conservation incentives. *Bottom-line, we have met our standard of providing reasonable and stable water rates for the customers.*

**Slide 25:**

Now that you understand the process let's take a look at what it means for an individual account. Here's an actual single family residence with a 1 inch meter that used 438 CCF for the year.

As you can see in the third column that account paid $940.60 for the 438 CCF under the current rate structure. In the fourth column you see that under the new annual fees calculated using the Consumption-based Fixed Rate method, the account's fees would rise 16% to $1,091.67. That's an increase of $151. Any questions?

**Slide 26:**

Let's put that $151 into perspective.

The change for the individual account is $150, but that $150 change means a change of less than one penny for all the other accounts billed by the agency.

We refer to that as "the Insurance Effect" . . . accounts across the rate structure are insulated from significant consumption changes by an individual account.

**Slide 27:**

Does comparing the New Rates to the Current Rates tell us anything?.

**Slide 28:**

The problems with Meter-based Fixed Rates aren't only fiscal (e.g. creating a structural deficit), but also that there is significant subsidization between accounts, with the 5,800 accounts above the yellow line "subsidizing" the 5,800 accounts below the yellow line.

**Slide 29:**

Just how much is that subsidy?

**Slide 30:**

As this slide shows you, one third of the accounts, the ones with the highest water consumption, are getting an over $150 thousand dollar subsidization from the two thirds of the accounts with lower water consumption. Said another way, in the Single Family Residence ¾ inch meter category, 3,900 accounts are being subsidized by 7,700 accounts. Is that fair? Is that proportional?

**Slide 31:**

Here are two apartment complexes that:

- Are using essentially the same amount of water;
- Are putting the same “load” on the to the water system;
- Are extracting the same amount of value from the water system; and
- Contributed the same amount of draw in the engineering process and design of how much capacity the water system should have.

Look over in the far left-hand column and you will see that these two apartment complexes have different size meters. Why they have different size meters for the delivery of the same capacity of water is probably an accident of history. Does that accident of history mean anything?

In the right three columns the current fees for the 2-inch meter apartment complex, because of its lower Fixed Fee is paying just a bit under $24,000 per year, while the 4-inch meter apartment complex is paying just over $27,500.

**Slide 32:**

If we were billing under the Consumption-based Fixed Rates, the almost $4,000 difference between these accounts would come down to less than $1,000

Said another way, over $2,800 of inter-account subsidization for these two accounts would be eliminated.

**Slide 33:**

Which fee structure do you think is fairer? Which fee structure s more proportional?

**Slide 34:**

Having looked at individual accounts, let's aggregate all of those individual accounts up into a larger picture. Here you see that:

- The combination of the large and small commercial accounts are getting a $130,000 subsidy;
- Parks are getting a $213,000 subsidy
- Schools are getting a $83,000 subsidy
- Those subsidies are coming from single-family residences, which are subsidizing to the tune of $226,000, and
- Multifamily residences, which are subsidizing to the tune of $180,000

**Slide 35:**

The subsidization isn't just between classes. Here you see two single-family residential neighborhoods that have very large lots by comparison to the rest of the City, and one of them, my neighborhood El Macero is getting subsidized to the tune of $51,000 a year.

For what it is worth, that individual account example that we showed you earlier where the annual bill would go up by $151 is Matt’s home in El Macero.

**Slide 36:**

Arguably, setting fixed fees by meter size fails Proposition 218's proportionality test

**Slide 37:**

Bottom-line, Consumption-based fixed rates produce balance between competing objectives

**Slide 38:**

Which brings us back to the three forces affecting water agencies when they create water rate structures, 1) Prop 218, 2) Article X of the California Constitution, and 3) and Fiscal Responsibility. The reality is that over the last 20+ years the focus has been on balancing the first two of these, and it's time to give the third equal weight. In all honesty, we can't afford to do otherwise . . . especially since a solution is at hand.

**Slide 39:**

And in the process help agencies eliminate the Fiscal Pain associated with Structural Deficits and the Political Pain of frequent rate hikes.

**Slide 40:**

A good rate consultant can model water conservation expectations and build mini rate increases into a multi-year rate structure, but as soon as actual conservation exceeds what is in their model, the rate structure "breaks." Consumption-based fixed revenue, will never be captive to the vagaries of a model. 100% of the fixed costs will be covered 100% of the time.

**Slide 41:**

And the customers will truly be writing a consistent check.

**Slide 42:**

For fixed fees that are truly fixed.

**Slide 43:**

As conservation happens, because there Is no Structural Deficit.

**Slide 44:**

The agency will absorb the reduced demand without fiscal pain..

**Slide 45:** Questions